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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/507,465	02/22/2000	Rodney C. Langley	M4065.0018/P018-A	2423

24998 7590 02/05/2002

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EXAMINER
ANDERSON, MATTHEW A

ART UNIT	PAPER NUMBER
1765	11

DATE MAILED: 02/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

A3 -11

Office Action Summary	Application No.	Applicant(s)	
	09/507,465	LANGLEY ET AL.	
	Examiner	Art Unit	
	Matthew A. Anderson	1765	

-- The MAILING DATE of this communication appears on the c ver sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 November 2001* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *10, 12-16, 26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *10, 12-16, 26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Examiner's Remarks

1. The examiner notes the lack of indication of finality in paper # 6. Consequently, papers #8 and 9 are withdrawn and the amendment of paper # 7 has been entered into the record.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 10, 12-16, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saeki et al. (US 5,460,684) in view of Nakayama et al. (US 4,902,531).

Saeki et al. discloses a plasma etching apparatus used to etch a semiconductor wafer. The plasma etching apparatus includes an electrostatic chuck, for attracting and holding a semiconductor wafer, provided on a susceptor. See abstract. Saeki et al.'s electrostatic chuck and susceptor read on applicant's chuck and pedestal, respectively.

Saeki et al. discloses that the plasma etching apparatus contains a cooling block **21** with a bore **22**, wherein bore **22** is used to circulate coolant. See column 4, lines 4-6. Saeki et al. also discloses that susceptor **2** is fixed on cooling block **21**. See column 4, lines 11-18. Saeki et al.'s susceptor **2** reads on applicant's pedestal. In column 4, lines 6-10, Saeki et al.'s states that introduction tube **22*a***, which supplies coolant into the process chamber, and an exhaustion tube **22*b***, which removes coolant from the process chamber, are connected to bore **22**. This reads on applicant's steps of internally cooling the chuck.

Saeki et al. discloses that the semiconductor wafer is unloaded after completion of etching. Saeki et al. shows that pusher pins **27**, which are actuated by driving means **26**, project so as to push up the wafer from susceptor **2**. See column 4, lines 54-56; and column 5, lines 51-62. This reads on applicant's step of unloading the wafer from the chuck after plasma etching.

Claim 10 differs from Saeki et al. by specifying that the pedestal is rotating during plasma etching of the wafer. Nakayama et al. discloses a vacuum processing method (applicable to plasma etching see col. 9 lines 20-30) and apparatus wherein a susceptor, which supports a substrate to be processed and is fixed to a rotating shaft, is contained within a vacuum chamber. See column 4, lines 65-68; column 5, lines 12-17; and abstract. Nakayama et al.'s rotating susceptor reads on applicant's pedestal. It is the examiner's position that a person having ordinary skill in the art at the time of the claimed invention would have found it obvious to modify Saeki et al. by using a rotating susceptor, as disclosed by Nakayama et al., because it would have been anticipated to

produce an expected result of a plasma etching method. The examiner notes that the modification of the bore of Saeki et al. to fit the shaft of Nakayama et al. would have been within the knowledge of one of ordinary skill in the art in light of Nakayama et al.'s central rotation shaft. The coolant of Saeki could, in such a combination, travel only upward to the pedestal through the shaft.

Claim 15 specifies that the process parameters be initialized. Applicant states that the process parameters include gas flow, process chamber pressure, wafer temperature, and pedestal rotation speed. Saeki et al. states that process gas flow is supplied and stopped with the use of a high-frequency power supply; process chamber pressure is set and maintained with the use of a vacuum pump; and wafer temperature is set with the use of a heat conductive gas and a cooling block. See column 3, lines 62-66; column 5, lines 26-53. Nakayama et al. states that the pedestal rotation speed is monitored with the use of a rotation motor. See column 5, lines 20-24. It is the examiner's position that a person having ordinary skill in the art at the time of the claimed invention would have found it obvious to control the process parameters, as listed in claim 15, because control of each process parameter would be inherent in plasma etching methods and apparatuses and their combination would have been anticipated to produce an expected result.

Response to Arguments

4, Applicant's arguments filed 11/19/01 have been fully considered but they are not persuasive.

In response to the argument that the examiner's prima facie case of obviousness is insufficient is not convincing. The examiner has given a motivation for combination. The expected result would be a method of plasma etching utilizing a rotating pedestal (i.e. susceptor)and a chuck for holding the wafer to be etched on the cooled pedestal. Combining known components of plasma etching systems and then using them would have been obvious. The applicant cannot make the case that there is no motivation for the combination if he merely chooses to not recognize the motivation that is presented. The applicant's argument that the "expected result" was beyond those of ordinary skill in the art is not convincing in that the rotation was suggested by Nakayama et al. as ensuring the uniform flow of gases over the substrate (col. 7 lines 15-25) and that the gas flow would be equally applicable to plasma etching systems (col. 9 lines 20-30). It also is not convincing in light of Saeki et al. which discloses the cooling of the substrate to the correct processing temperature (col. 5 lines 40-45). These disclosures at least suggests process parameter uniformity as a unifying theme in plasma processes.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208

USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Nakayama et al. suggests using a rotating pedestal in plasma etching in col. 9 lines 20-30. The arguments concerning CVD are moot in light of this suggestion. Saeki et al. suggests cooling the pedestal and as a result the chuck. Nakayama et al. suggests rotation of the pedestal.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., better film uniformity) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

The applicant's argument that the optimization of process parameters was not suggested by the combination presented is not convincing. The specified process parameters were taught in the references and the optimization of such parameters would have been merely the execution of the process engineering profession.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew Anderson whose telephone number is (703) 308-0086.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin L. Utech can be reached at (703) 308-3836. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3599 for regular communications and (703) 305-6078 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

MAA
February 4, 2002

BENJAMIN L. UTECH
SUPERVISORY PATENT EXAMINER
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